

Middle and South Atlantic coasts. During the 29th and 30th the storm disappeared into Canada. In New England and the Lake region it continued very severe on the former of these dates, the easterly winds rising to 38 miles at Portland, and 34 at Boston, and the westerly gales along the Lakes varying from 30 to 34 miles per hour. In advance of this storm, Cautionary Signals were hoisted on the 27th along the Texas coast, from North Carolina to New York, at Grand Haven and Milwaukee, and the 23th, along the New England coast, and Canadian stations notified from Lake Huron to Montreal. The display was justified at all of them.

No. VIII.—At Portland, Or., this storm was preceded by brisk southerly winds and rainy weather on the 28th, and accompanied by a heavy hail-storm on the 29th. Snow-storms prevailed during the 30th from Utah and Colorado northward, and rapidly falling barometer, with warm, southerly winds, in the Southwest. By 11 p. m., of the 31st, the central area of lowest pressure had advanced southeastward into Texas. On its eastern side the rain-area reached the Lower Mississippi valley, and on its northwestern side severe snow-storms continued, with northerly winds, from New Mexico to Wyoming. Heavy thunder-storms were reported from the Southwest. At Dodge City, Kan., the anemometer registered from 49 to 55 miles per hour during the forenoon.

TEMPERATURE OF THE AIR.

The isothermal curves, in red, upon chart No. II, illustrate the general distribution of the temperature of the air for the month. A reference to the table, in lower left-hand corner upon the same chart, shows that it has averaged above that for many years at the Pacific coast stations, and 2.5 above at Salt Lake City. In the remaining sections, the average has been below the normal from 1° to 7.5, the difference being greatest for the Northwestern States. At Virginia City, Cheyenne, Denver and Santa Fé, it has averaged from 0.6 to 3.7 below. Minimum and maximum temperatures, respectively, for the month, are given for the following stations, viz: Pembina, —27°, 35°; Brocktonridge, —30°, 44°; Duluth, —10°, 43°; Bemis Fork, —22°, 42°; Cheyenne, —3°, 60°; Virginia City, —19°, 52°; Salt Lake City, 18°, 65°; Pikes' Peak, —20°, 25°; Santa Fé, 5°, 60°; Leavenworth, 2°, 68°; Marquette, —6°, 53°; Alpena, —6°, 62°; Erie, 4°, 69°; Cincinnati, 16°, 73°; Oswego, 6°, 59°; Malone, N. Y., —4°, 65°; Mt. Washington, —25°, 47°; Eastport, 0°, 45°; New York, 12°, 70°; Washington, 14°, 76°; Ft. Gibson, 7°, 83°; Indianola, 37°, 80°; New Orleans, 20°, 79°; Savannah, 30°, 80°; and Key West, 59°, 86°.

Ranges of Temperature.—In addition to the above, some of the greatest ranges are for St. Louis, Manhattan, Ks., and Omaha, 68°; Pittsburgh, 72°; North Platte, 74°, and Dodge City, 80°. Some of the least ranges are for Portland, Or., 26°; San Francisco, 29°; San Diego and Thatcher's Island, Mass., 34°; Cape May, 36°; Newport, 39°; Galveston, 40°; Tybee Island, Ga., 44°; and Mobile, 45°.

Frosts and ice, destructive to fruits and early vegetables, besides those mentioned in connection with the movement of high-pressure areas,—12th, peaches killed at Wytheville, Va.; 13th and 28th, Humboldt, Tenn., fruit and early vegetables killed; 13th to 18th, Benetisville, Ky., peaches killed; 16th to 19th, Baxter Springs, Kan., peaches killed; 18th, Dodge City, Ks., all fruit killed; 18th to 23d, McMinnville, Tenn., peaches killed; 19th, Caperville, Va., all fruits killed; 20th, Melissa, Houston and Austin, Tex., vegetation and fruits killed; 20th, 21st and 22d, Humboldt, Tenn., and Monticello, Ark., fruits and vegetables injured; 21st and 29th, Gilmer, Tex., fruit injured; 24th, Norfolk, Va., pears damaged; 25th, Ringgold, O., fruit, &c., killed; 26th, Keokuk, Ia., peaches injured; 31st, Alta Vista, Va., and Louisville, Ill., peaches killed; during the month, much damage at Clarksville, Tex.; peaches killed, and pears partly, Attaway, N. C.; and fruit killed at Asheville, N. C.

PRECIPITATION.

Upon chart No. III is represented the distribution of rain-fall and melted snow for the present month. The amount of snow caught in the gauges was frequently less than the actual fall in the northern sections, owing to loss during the prevalence of high winds and gales. Except the slight deficiency in the South Atlantic States and the average fall in Minnesota, the precipitation has largely exceeded the normal.

Snow-fall.—Reports of snow-fall vary from 18 to 35.5 inches in Me.; 17 to 39 in Vt. and N. H.; 3.5 to 14 in Mass., Conn., N. J., Va., Ala., Ark. and Tenn.; 9 to 31.5 in Ky., Ohio, Ind., Ill. and Iowa; 12.5 to 44 in Mich. and Wis.; 10 to 21 in Minn. and Dakota; 7.5 to 38 in Kan., Neb., Col. and Utah.

Rainy Days.—The number of days, during which rain or snow fell, averages as follows: Middle Atlantic States and New England, 14; South Atlantic and Gulf States, 10; Ohio valley and Tennessee, 15; Lower Lake region, 21; Upper Lake region, 15; upper Mississippi and lower Missouri valleys, 13; Rocky Mountain stations, 14. At Portland, Or., 26 rainy days were recorded, San Francisco, 10 and San Diego, 4.

Cloudy Days.—The number, for New England, varies from 6 to 17; Middle States, 5 to 17; South Atlantic States, 3 to 10; Gulf States, 3 to 16; Tennessee and Ohio valley, 4 to 17; Lake region, 6 to 21; west of the upper Mississippi valley, 7 to 16; Territories, 9 to 17.

Hail.—The following have been reported in addition to those mentioned before: on 1st, Creswell, Kan.; 5th, Genoa, Neb.; 10th, Cresco, Ia.; 15th, Houston, Tex.; 16th, Hudson, Cleveland, and near Cincinnati, O.; 17th, Sebec, Me.; 20th and 28th, New Germantown, N. J.; 25th, Astoria, Or., and Milford, Del.; 28th, Danville, Ky.

Droughts.—In the southern part of New Mexico, a scarcity of water is reported on the 3rd.

Floods.—On the 6th, 7th and 8th, in the vicinity of La Crosse, Wis.; 9th, at Contoocookville, N. H., mills stopped; 19th, lower part of Galveston flooded by water being driven in from the Gulf during the southeast gale; 25th and 26th, rivers in New England high and overflowing at many points; 28th, Illinois and Sangamon rivers, Ill., out of their banks; 29th, Billerica, Mass., Concord river higher than for 40 years past; 30th and 31st, Cairo, floods and break in levee.

RELATIVE HUMIDITY.

The average relative humidity for the month ranges on the New Jersey and New England coasts from 70 to 78 per cent.; Middle Atlantic States, 56 to 68; South Atlantic States, 58 to 60; Tennessee and the Gulf States, 59 to 72; Ohio and the Upper Mississippi valleys, 64 to 74; Lake region, 69 to 82; lower Missouri valley, 69 to 80; valley of the Red River of the North, 79 to 87; Pacific coast, 67 to 79. **Dry Stations.**—Santa Fé and Colorado Springs, 45 per cent.; Denver, 53; Lynchburg, 56; Bismarck, 57. **Moist Stations.**—Mount Washington, 88; Pembina, 87; Milwaukee and Albany, 82; Cleveland, Erie and Evanston, 81; Omaha, 80.

WINDS.

Prevailing Winds.—By an examination of chart II, it will be seen from which direction the winds have blown most frequently. The arrows fly with the wind. Generally, they point from the high towards, inclining somewhat to the right of, the low pressure.

Total Movements.—The largest total movements of the air, excluding directions, have been recorded at the following stations: Pike's Peak, (30 days only,) 19,781 miles; Sandy Hook, 15,815; Long Branch, 14,376; Thatcher's Island, 13,600; Barnegat, 12,865; Dodge City, 11,571. The smallest total movements reported are: Portland, Or., 3,162 miles; Virginia City, 3,590; Lynchburg, 3,920; Burlington, Vt., 4,643; Nashville, 4,710; Augusta, Ga., 4,920.

Maximum velocities, in addition to those given above, have been recorded at Gainesville, Ga., 70 miles per hour on the 19th; Freehold, N. J., over 60, Stapleton, N. Y., estimated at 70, and Flushing, N. Y., N. E., 60, 28th; Mt. Washington, N. W., 96, 6th, S. E. 76, 21st, and N. W. 100, 22d.

Tornadoes are reported to have occurred at Hazel Green, Grant Co., Wis., and Hassard, Rall's Co., Mo on the 10th; near Larned, Kan., 5th; South Hartford, Washington Co., N. Y., 21st.

VERIFICATIONS.

Probabilities, as worked up three times each day and issued to the public, of the weather for the ensuing twenty-four hours, have been carefully compared with the actual conditions following. The per centage of verifications has averaged 93.7 for New England; 95.4 for the Middle States; 91.7 for the South Atlantic States; 94 for the Eastern Gulf States; 83.7 for the Western Gulf States; 91.8 for Tennessee and the Ohio valley; 90 for the Lower Lake region; 91.3 for the Upper Lake region; 89.4 for the Upper Mississippi valley; 85.5 for the Lower Missouri valley. The average per centage of verifications for the month is 90.6.

Cautionary Signals.—Out of 167 displayed at stations along the Gulf and Atlantic coast, Milwaukee and Grand Haven, the only stations along the Lakes warned during the month, 159 were justified, and 8 not justified, by succeeding wind velocities of 25 miles per hour. It may be stated here that, during cold weather, especially while snow is falling and the wind blowing on the coast, navigation becomes dangerous with even less than 25 miles of hourly velocities. A few cases have been reported in which the signals have been ordered late; and 40 from scattered stations, with hourly velocities ranging from 25 to 54 miles, where signals were not ordered to be displayed.

NAVIGATION.

Muscataine, Iowa, first boat of season arrived 7th; Achusnet river, at Fairfield, Mass., was clear of ice 7th, frozen over 20th, clear 23d; Plattsmouth, Neb., heavy ice in Missouri river 28th; ice on the Hudson river remained firm at Newburgh, 2d, moved out the 4th, river open to Poughkeepsie and navigation resumed the 6th; navigation not been suspended on Seneca lake, N. Y., during the winter; Buffalo, N. Y., ice in lake six inches thick 1st, ice went out of river 8th; Middletown, Conn., river free of ice 9th; New York steamer arrived the 17th; Mississippi opened at Dubuque, Iowa, 13th; river clear at Dayton, 4th and 24th, first boat arrived 7th; ice went out of harbor at Cleveland, Ohio, 6th; Rochester, N. Y., ice went out of river 7th; Omaha, Neb., ice went out of river below bridge 31st; Grand Haven, Mich., navigation resumed 11th; forty miles south of Sable island, Nova Scotia, navigation obstructed by ice fields.